ABSTRACT:

The present invention discloses an improved adaptive line enhancer comprising an adaptive Gray-Markel lattice notch filter having an adaptive notch frequency, in which the notch frequency is determined according to a notch frequency variable k, characterized in that the value of k for the n+1th sample period is determined according to the following equation:

$$k(n+1) = k(n) - \operatorname{sgn}[y(n)]\operatorname{sgn}[UPDATEFN] \times \mu$$

in which y(n) is the notch filter output, μ is the adaptation constant, and $UPDATEFN$ has a transfer function in the z-transform domain of:

$$\frac{(\alpha-1)(k(n)-1)z^{-1}}{1+k(n)(1+\alpha)z^{-1}+\alpha z^{-2}}$$

in which α determines the bandwidth and k(n) is a variable for determining the current notch frequency.

A corresponding method is also disclosed.

The algorithm for adapting the notch frequency enables the notch frequency to be directly calculated from knowledge of internal variables of the wave digital filter.